

CLAIM AMENDMENTS

1. (canceled)

1           2. (previously presented) The method according claim 20  
2 wherein a target with a doping content of less than 1.5 at-% is  
3 used.

1           3. (previously presented) The method according to claim  
2 20 wherein a target with aluminum as the doping agent is used.

1           4. (previously presented) The method according to claim  
2 20 wherein the substrate is heated to above 250 °C.

1           5. (previously presented) The method according to claim  
2 20 wherein a dynamic deposition rate of greater than 80 nm\*m/min is  
3 set that corresponds to a static deposition rate of greater than  
4 300 nm/min.

1           6. (previously presented) The method according to claim  
2 20 wherein a dual magnetron arrangement with medium frequency  
3 excitation is used.

1           7. (previously presented) The method according to claim  
2   20 wherein a dynamic flow process is carried out in which the  
3   substrate is moved during sputtering.

1           8. (currently amended; withdrawn) A conductive and  
2   transparent zinc oxide layer, produced with the method according to  
3   claim 20, wherein the content of doping agent, in the produced  
4   oxide layer is less than 3.5 at-%, the resistivity is less than  
5    $1 \times 10^{-3}$  W cm, the charge carrier mobility is greater than 25 cm<sup>2</sup>/V s,  
6   and the averaged transmittance of 400 to 1100 nm is greater than  
7   80%.

1           9. (withdrawn) The oxide layer according to claim 8  
2   wherein the content of doping agent is less than 3 at-%,  
3   particularly less than 2.5 at-%.

1           10. (withdrawn) The oxide layer according to claim 8  
2   wherein the resistivity is less than  $5 \times 10^{-2}$  W cm.

1           11. (withdrawn) The oxide layer according to claim 8  
2   wherein the charge carrier mobility is greater than 35 cm<sup>2</sup>/V s.

1           12. (withdrawn) The oxide layer according to claim 8  
2   wherein the averaged transmittance of 400 to 1100 nm is greater  
3   than 82%.

1                   13. (withdrawn) The oxide layer according to claim 8  
2 wherein the layer comprises aluminum as the doping agent.

1                   14. (withdrawn) Use of an oxide layer according to  
2 claim 8 in a solar cell.

1                   15. (withdrawn) The use according to claim 14 in a  
2 crystalline silicon thin-film solar array.

1                   16. (withdrawn) The use according to claim 14 in an  
2 amorphous and crystalline silicon tandem solar array.

1                   17. (previously presented) The method according claim  
2 20 wherein a target with a doping content of less than 1 at-% is  
3 used.

1                   18. (previously presented) The method according to  
2 claim 20 wherein the substrate is heated to temperatures above  
3 300 °C.

1                   19. (previously presented) The method according to  
2 claim 20 wherein a dynamic deposition rate of greater than 100  
3 nm\*m/min is set that corresponds to a static deposition rate of  
4 greater than 380 nm/min.

1           20. (currently amended) A method of making a conductive  
2 and transparent zinc-oxide layer on a substrate by reactive  
3 sputtering, the sputtering process including a hysteresis region, a  
4 heater for heating the substrate to more than 200 °C, and a dynamic  
5 deposition rate of greater than 50 nm\*m/min that corresponds to a  
6 static deposition rate of more than 190 nm/min, the method  
7 comprising the steps of:

8           using a metallic Zn target with a doping content of less  
9 than 2.3 at-%;

10           controlling subsequent etching behavior and resulting  
11 surface roughness of the zinc-oxide layer by selecting a stabilized  
12 operating point within the unstable process region that is located  
13 between a transition point between a stable metal process and an  
14 unstable process and an inflection point of the stabilized process  
15 curve; and

16           post-treating the zinc-oxide layer by wet-chemical or dry  
17 etching to develop a root-mean-square roughness of 30 to 300nm.